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AUTHOR Dolly, John P.; Williams, Kathy S.
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ABSTRACT

Six studies which were conducted to determine the effects of testwiseness training on middle school and undergraduate college students' test scores are described. Testwiseness was defined as the cognitive ability or set of skills which a test taker can use to improve his or her score. Testwiseness training presented methods for using deductive reasoning procedures to maximize scores derived from guessing the answer. The treatment consisted of lecture/discussion presentations of Millman's (1969) test-taking principles and Smith's (1982) convergence strategies. The results of the testwiseness treatment were mixed. The studies did not indicate a significant improvement in testwiseness as a result of the training. (DWH)

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TESTWISENESS TRAINING: IS IT GENERALIZABLE?

John P. Dolly Kathy S. Williams

University of Wyoming

Paper presented at the Annual Meeting of the Northern Rocky Mountain Educational Research Association, Jackson, Wyoming, October, 1984.

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TESTWISENESS TRAINING: IS IT GENERALIZABLE?

ABSTRACT

Six studies attempted to teach cognitive strategies to students in order to improve their scores on multiple choice tests. The treatment consisted of lecture/discussion presentations of deductive reasoning strategies to help students maximize scores on items to which they guessed an answer. The results of the testwiseness treatment were mixed. None of the studies conducted resulted in a significant improvement in testwiseness.

TESTWISENESS TRAINING: IS IT GENERALIZABLE?

Testwiseness is described as a cognitive ability or set of skills that a test-taker can use to improve his/her score no matter what the content area of a test (Sarnacki, 1979). The testwise test-taker is able "to utilize the characteristics and formats of the test and/or test-taking situation to receive a high score" (Millman, Bishop, and Ebel, 1965, p. 707). While some students complain that they are unable to achieve high test scores despite knowing the material, others are able to do well on tests even though their level of preparation is less than adequate. Current research speculates on the existence of a characteristic labeled testwiseness, i.e. an ability of the test-taker to perform at a better than chance level on a multiple choice test no matter what the content being tested. All following comments concerning testwiseness will refer specifically to performance on four item multiple choice tests.

A taxonomy of testwiseness principles was developed by Millman, et al. (1965). The principles include time-using strategies, error avoidance strategies, explanation of correction formula for guessing and deductive reasoning strategies. The taxonomy also covers consideration of the test writer's intent, use of clues provided by the test writer's idiosyncrasies, and identification of item flaws which may signal a correct choice.

Smith (1982a) suggests that the cognitions of skilled test-takers consist of

1. the cognitive monitor which controls which skills are going to be brought to bear on the (test) item which is under consideration (metacognition).

2. the abilities and skills that the individual has which relate to the trait being measured (knowledge),

3. the set of testwiseness strategies which the individual has determined are relevant to the authors of the test (testwiseness),

4. the response of the individual (the selection and record of a choice) and the refinement of the individual's assessment of the author's item writing style" (p. 5).

The process works like this. A test-taker reads the stem of the multiple choice item and then attempts to recognize the answer among the list of options. If the answer is not identified, a skilled test-taker will next try to analyze the question using a cognitive monitor, combining that information with whatever testwiseness strategies the individual possesses. An answer is selected and then integrated with the knowledge and judgments the test-taker has made concerning the intent and style of the test author. This process measures the trait ostensibly being tested, however, many other characteristics of the test-taker enter into the final score received on an objective examination.

When examining the multiple choice test situation from the standpoint of the item, problems are considered to result from poor test construction. However, viewing the situation from the test-taker's perspective, problems are the result of a lack of knowledge or lack of testwiseness. "More error in measurement is likely to originate from students who have too little, rather than too much, skill in taking tests" (Ebel, 1965, p. 3). Therefore, attempting to instruct students in testwiseness is likely to result in more validity for the measuring instrument, since "the student low in testwiseness tends to be penalized every time he takes a test which involves a testwiseness component" (Crehan, Koehler, and Slakter, 1974, p. 211).

Methods

Six separate studies were conducted to attempt to answer the question: Can testwiseness training improve scores on multiple choice exams? College students were the subjects in five of the studies, and middle school students were subjects in one of the studies. A decision was made to teach only the cognitive skills and strategies which were hypothesized as comprising testwisenss. Specifically, experimental subjects were given lecture/discussion presentations covering aspects of Millman's (1969) test-taking principles for multiple choice questions and Smith's (1982b) convergence strategies. The testwiseness training presented methods for using deductive reasoning procedures in order to maximize guessing. All studies used a pretest-posttest design with random assignment to experimental or control conditions.

Study 1. College seniors were subjects (n=40). The pre- and post- measures were taken from a standardized reading comprehension test (SRA). For purposes of this study, subjects were <u>not</u> given the reading selections, but were required to answer the comprehension questions. This approach was used in order to minimize the impact of knowledge on test scores, and maximize the impact of testwiseness on test scores. The questions were selected in a random fashion and were not scrutinized to determine their possible susceptibility to testwiseness strategies. An ANOVA showed the 18 experimentals outperforming the 22 controls at the .07 level. The difference was not significant.

Study 2. Ninety-three college sophomores were randomly assigned to experimental (n=42) and control (n=51) groups. The treatment was the same, but the pre- and posttests were regularly scheduled, in-class, teacher-made tests. Results showed controls outperforming experimentals at the .07 level. This was not significant, and the trend was not in the direction predicted.

Study 3. College sophomores were subjects (n=42), and although not significant, again the controls (n=14) scored higher than experimentals (n=28) ($p<.20$).

Study 4. The testwiseness treatment was simplified and four specific strategies were presented to middle school social studies students (10 controls, 8 experimentals). The cognitive strategies taught to the subjects were absurd options (Gibb, 1964), similar options (Millman, 1969), specific determiners (Slakter, Koehler, and Hampton, 1970), and the convergence strategy (Smith, 1982b). Experimentals scored in the desired direction on the posttest, but statistical significance was not achieved, $p<.36$.

Study 5. Subjects were college sophomores (22 controls, 27 experimentals) who received the simplified treatment. No differences were apparent in the posttest scores of both groups. In-class, teacher-made tests were used for pre- and post- measures.

Study 6. College freshmen were presented the simplified treatment. The 12 experimentals and 14 controls showed no significant differences on the standardized reading comprehension test (SRA) used to gather pre- and post- scores of both groups.

Summary of the studies. Statistically significant results were not obtained in any of the studies. Examining the raw scores showed two studies in which the experimental groups improved; two studies in which the control groups improved; and, two studies in which neither group showed any change from pre- to post- measures.

Discussion

If "(T)estwiseness is widely recognized as a source of additional variance in test scores. . . ." (Sarnacki, 1979, p. 253), why could the principles of testwiseness not be trained and demonstrated in the above studies?

The majority of the work on testwiseness has attempted to evaluate the level of testwiseness that a test-taker possesses by testing for testwiseness. Hence, there exists a great deal of abstract data on who shows what degree of testwiseness, at what grade level, etc. Few studies actually attempt to measure a subject's ability to improve his/her test score after a testwiseness training program, as was attempted in the present studies.

After reviewing past research, one can deduce that the types of instruments developed to measure testwiseness generally fall into two categories: single clue items and content free items. Gibb (1964), Millman (1969), and Wahlstrom and Boersma (1968) used different methods to develop single clue testwiseness instruments. All three studies made certain that each item on the test contained only one testwiseness clue. A very logical, consistent set of items was produced to enable the researchers to evaluate the impact of only one aspect of testwiseness in each item. The results showed that subjects could be taught testwiseness principles and could exhibit that skill, but only in a controlled laboratory testing situation. The present studies used items more typical of regular testing situations that students are likely to encounter in academic settings, and failed to show significance. The multiple choice items were not designed to be susceptible to testwiseness training, but rather were typical items used in college and middle school tests. Perhaps the leap from lab to field research is premature.

In the present work, the experimental group which showed the most gain in posttest scores consisted of seniors who were tested on a standardized test which would have no personal consequences for them. Perhaps the college seniors were better able to perform the complex cognitions necessary due to a lack of emotional pressure and more experience with test-taking.

Another possibility may be that certain characteristics must be present in students in order to enable them to profit from testwiseness training. Bajtelsmit (1977) found an interaction between treatment conditions of testwiseness training and desensitization of test anxiety. Subjects who received both treatments scored lower than subjects receiving either treatment by itself. Presenting subjects with several approaches to test-taking may "create conflicting orientations and overwhelming situational complexity" (Bajtelsmit, 1977, p. 340) which may have a deleterious effect on test performance.

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